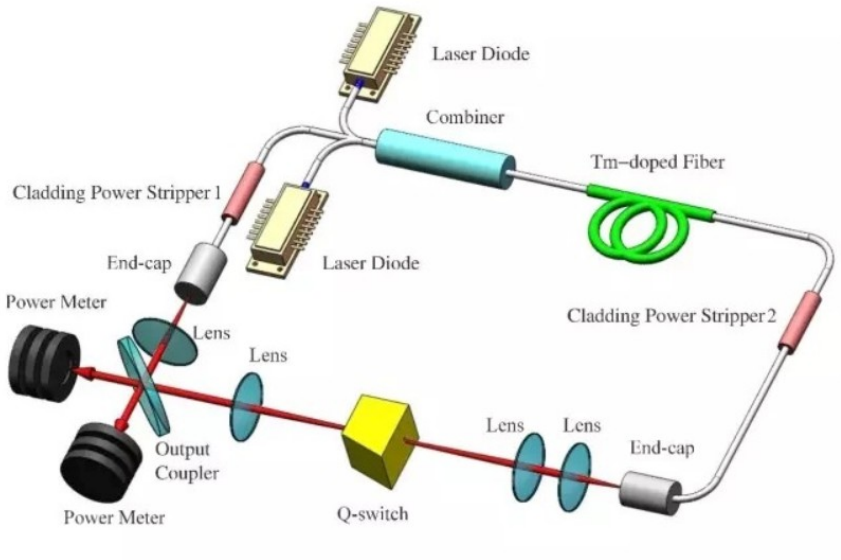
Difference between fiber laser marking machine and CO2 laser marking machine

The difference between fiber laser marking machine and carbon dioxide laser marking machine is mainly the working principle, advantages and application industry of laser.

Fiber laser refers to the laser source that uses rare-earth-doped glass fiber as the gain medium. The working principle of fiber laser is that it is easy to form high power density in the fiber under the action of pump light, which causes the laser energy level of the working substance of the laser to "particle number inversion ", When a positive feedback loop (forming a resonant cavity) is properly added, a laser oscillation output can be formed, and a laser beam with a wavelength of 1064 nm is generated.

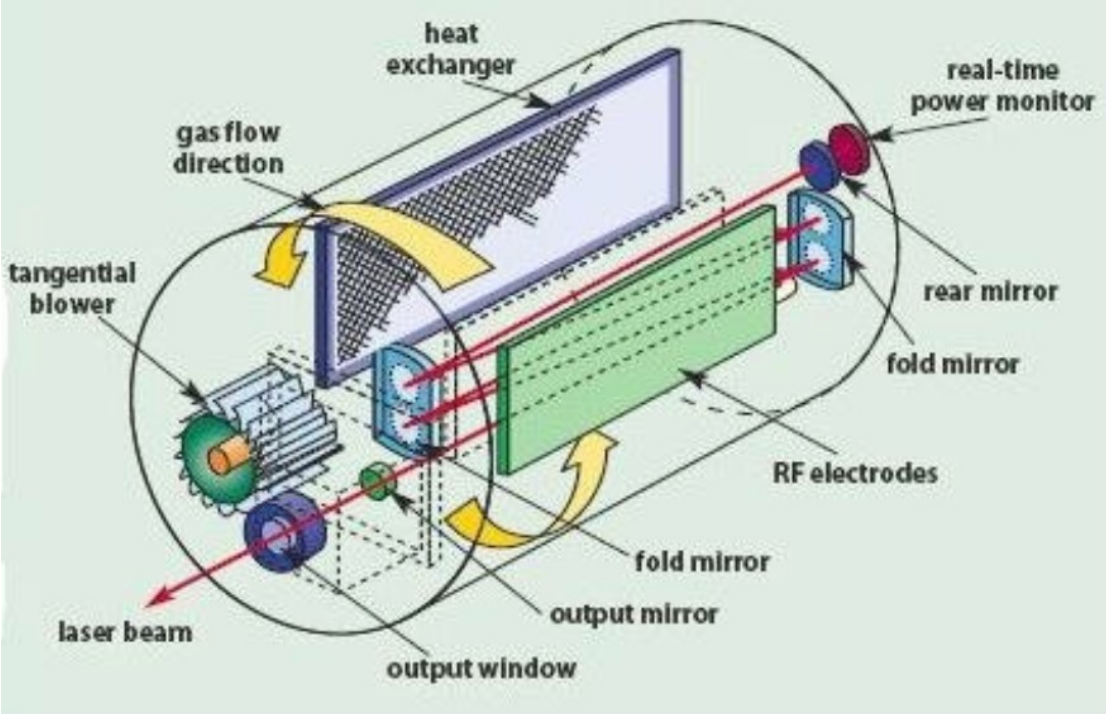


Advantages of fiber lasers:
1. The manufacturing cost of glass fiber is low, the technology is mature, and the life is up to 100,000 hours;
2. Fiber laser is smaller and more integrated;
3. No adjustment, no maintenance, high stability;
4. Fiber lasers are qualified for harsh working environments and have a high tolerance for dust, vibration, shock, humidity, and temperature;
5. No need for thermoelectric cooling and water cooling, just simple air

cooling can greatly reduce costs;
6. High electro-optical efficiency: The comprehensive electro-optical efficiency is over 25%, which can greatly save power consumption during work and save costs.

Application scope of fiber laser marking machine: all kinds of metals and some non-metals, electronic separation components, integrated circuits (IC), electrical circuits, mobile phone communications, hardware products, cutlery and kitchenware, tool accessories, precision instruments, glasses and watches, computers Keyboards, jewelry, auto parts, plastic buttons, plumbing fittings, sanitary ware, PVC pipes, medical equipment, packaging bottles, etc.

The working principle of a CO2 RF tube laser is to excite a mixed gas of CO2, neon, argon, etc. through an excitation source, and then through particle number inversion and light amplification to finally generate a laser with a wavelength of 10.64um.



CO2 laser advantages:
1. The life of CO2 laser is up to 30,000 hours for one charge, and it can be used for inflation.
2. Cooling method: air cooling, stable long-term operation
3. The spot pattern is close to TEM00, the spot is round and uniform, and the spot diameter is small
4. Low voltage power supply, high safety

CO2 laser marking machine applications: clothing accessories, pharmaceutical packaging, alcohol packaging, building ceramics, beverage packaging, fabric cutting, rubber products, casing nameplates, craft gifts, electronic components, leather and other industries.

Compared:
1. The service life of the fiber laser marking machine is 100,000 hours, and the co2 marking machine is 30,000 hours. The former is much longer than the latter.
2. In terms of accuracy, fiber lasers are nano-level processing methods, while CO2 lasers are micron-level. The accuracy of fiber lasers is higher than that of CO2 lasers.
3. The application range of fiber laser marking machine is different from that of co2 laser marking machine. Fiber optic marking machine is more widely used than CO2 marking machine. But both have irreplaceable aspects.

The above is the difference between the fiber laser marking machine and the CO2 laser marking machine organized by Shandong Reaying Machinery Co., Ltd. Looking forward you contact us for a suitable laser technology solution.